

## **PICO Questions Used to Define Literature Search**

1. In patients with Parkinson's, are aerobic interventions more effective than no/other treatments in affecting patient outcomes?
2. In patients with Parkinson's, are resistance interventions more effective than no/other treatments in affecting patient outcomes?
3. In patients with Parkinson's, are balance interventions more effective than no/other treatments in affecting patient outcomes?
4. In patients with Parkinson's, are stretching/flexibility interventions more effective than no/other treatments in affecting patient outcomes?
5. In patients with Parkinson's, does cueing affect outcomes?
6. In patients with Parkinson's, do PD community exercise programs affect outcomes?
7. In patients with Parkinson's, does gait training improve patient outcomes?
8. In patients with Parkinson's, does task specific training improve functional outcomes?
9. In patients with Parkinson's, which prognostic factors affect outcomes?
10. In patients with Parkinson's, does physical therapy using a behavioral change approach improve physical therapy or exercise outcomes?
11. In patients with Parkinson's, does interdisciplinary care improve outcomes?
12. In patients with Parkinson's with DBS, does pre- and/or post-physical therapy improve outcomes?
13. In patients with Parkinson's, which specific motor learning strategies/interventions improve patient outcomes?
14. In patients with Parkinson's, does receiving care from an expert physical therapist, improve outcomes?
15. In patients with Parkinson's, does physical therapist management, augmented with mobile health technology, improve patient outcomes?

## Literature Search Strategy

**Database:** MEDLINE (Ovid MEDLINE® and Epub Ahead of Print, In-Process and Other Non-Indexed Citations, Daily and Versions®, version 1946 to July 17, 2019)

**Interface:** Ovid

**Dates Searched:** 7/18/2019; 6/16/2020

Line	Query
1	(exp "Animals"/ NOT Humans/) OR exp "Cadaver"/ OR (animal? OR dog OR dogs OR canine OR horse OR horses OR equine OR mouse OR mice OR rat OR rats OR rabbit OR rabbits OR sheep OR porcine OR pig OR pigs OR rodent?).ti. OR (cadaver* OR in vitro).ti,ab.
2	((comment or editorial or letter or historical article) not clinical trial) or address or news or newspaper article or case reports).pt. or (case report? OR abstracts OR editorial OR reply OR commentary).ti.
3	exp "Parkinson Disease"/ or ("parkinson disease" or "parkinson's disease").ti,ab.
4	exp "Exercise"/ or exp "Exercise Therapy"/ or (aerobic or aerobics).ti,ab.
5	exp "Resistance Training"/ or (strength or strengthening or resistance).ti,ab.
6	exp "Postural Balance"/ or (balance or postural or posture).ti,ab.
7	exp "Muscle Stretching Exercises"/ or exp "Exercise Movement Techniques"/ or (stretching or flexibility or yoga or "tai chi" or qigong or dance or dancing or boxing or training).ti,ab. or "Dance Therapy"/
8	exp "Cues"/ or (cues or cueing).ti,ab.
9	exp "Gait"/ or exp "Gait Analysis"/ or (gait).ti,ab.
10	exp "Physical Therapy Modalities"/ or "Rehabilitation"/ or "Occupational Therapy"/ or "Deep Brain Stimulation"/ OR "Transcranial Direct Current Stimulation"/ or "Transcranial Magnetic Stimulation"/ or ("physical therapy" or "physical therapies" or "physical therapist" or physiotherapy or physiotherapies or physiotherapist).ti,ab.
11	exp "Patient Care Team"/ or (multidisciplinary or interdisciplinary or "team based").ti,ab.
12	1 or 2
13	(3 and (4 or 5 or 6 or 7 or 8 or 9 or 10 or 11)) not 12
14	limit 13 to (english language and yr="1994-Current")
15	clinical trial.mp. OR clinical trial.pt. OR random:.mp. OR tu.xs.
16	(MEDLINE OR (systematic* AND review*) OR "meta analys*").ti,ab. OR (meta analysis OR systematic review).pt.
17	<b>14 and 15</b>
18	14 and (15 or 16)

**Database:** Embase

**Interface:** Elsevier (<https://embase.com>)

**Dates Searched:** 7/18/2019; 6/16/2020

Line	Query
1	cadaver'/de OR 'in vitro study'/exp OR 'abstract report'/de OR abstracts:ti OR 'book'/de OR 'editorial'/de OR editorial:ti OR 'note'/de OR 'letter'/it OR reply:ti OR commentary:ti OR 'case study'/de OR 'case report'/de OR 'conference abstract'/it OR 'chapter'/it OR 'conference paper'/it OR 'conference review'/it OR (cadever* OR 'in vitro'):ti,ab OR 'animal experiment'/exp OR (animal\$ OR dog OR dogs OR canine OR horse OR horses OR equine OR mouse OR mice OR rat OR rats OR rabbit OR rabbits OR sheep OR p\$ediatric\$ OR porcine OR pig OR pigs OR rodent\$):ti
2	parkinson disease'/de OR 'parkinson disease':ti,ab OR 'parkinson s disease':ti,ab
3	exercise'/de or 'kinesiotherapy'/exp or 'aerobic exercise'/de or (aerobic or aerobics):ti,ab
4	resistance training'/exp or (strength or strengthening or resistance):ti,ab
5	body equilibrium'/exp or (balance or postural or posture):ti,ab
6	stretching exercise'/exp OR 'muscle stretching'/exp OR 'dance therapy'/exp or (stretching or flexibility or yoga or 'tai chi' or qigong or dance or dancing or boxing or training):ti,ab
7	association'/exp AND (cues:ti,ab OR cueing:ti,ab)
8	gait'/exp or gait:ti,ab
9	physiotherapy'/exp OR 'rehabilitation'/exp or ('physical therapy' or 'physical therapies' or 'physical therapist' or physiotherapy or physiotherapist or physiotherapies):ti,ab
10	collaborative care team'/exp or (multidisciplinary or interdisciplinary or 'team based'):ti,ab
11	#2 NOT #1 AND [english]/lim AND [1994-2019]/py
12	#11 AND #3
13	#11 AND #4
14	#11 AND #5
15	#11 AND #6
16	#11 AND #7
17	#11 AND #8
18	#11 AND #9
19	#11 AND #10
20	#11 AND (#3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10)
21	crossover procedure':de OR 'double-blind procedure':de OR 'randomized controlled trial':de OR 'single-blind procedure':de OR (random* OR factorial* OR crossover* OR cross NEXT/1

	over* OR placebo* OR doubl* NEAR/1 blind* OR singl* NEAR/1 blind* OR assign* OR allocat* OR volunteer*):de,ab,ti
22	systematic review'/exp OR 'meta analysis'/exp OR ((systematic* NEAR/2 review*):ti,ab,kw) OR 'meta analys*':ti,ab,kw
23	<b>#12 AND # 13</b>
24	#12 AND (#13 OR #14)

**Database:** Cochrane Central Register of Controlled Trials (CENTRAL)

**Interface:** Wiley (<https://www.cochranelibrary.com/central>)

**Dates Searched:** 7/18/2019; 6/16/2020

Line	Query
1	[mh "parkinson disease"] or "parkinson disease" or "parkinson's disease"
2	[mh "exercise"] or [mh "exercise therapy"] or aerobic:ti,ab or aerobics:ti,ab
3	[mh "resistance training"] or (strength or strengthening or resistance):ti,ab
4	[mh "postural balance"] or (balance or posture or postural):ti,ab
5	[mh "muscle stretching exercises"] or [mh "exercise movement techniques"] or (stretching or flexibility or yoga or "tai chi" or qigong or dance or dancing or boxing or training):ti,ab
6	[mh "cues"] or (cues or cueing):ti,ab
7	[mh "gait"] or [mh "gait analysis"] OR gait:ti,ab
8	[mh "physical therapy modalities"] or [mh rehabilitation] or [mh "occupational therapy"] or ("physical therapy" or "physical therapies" or "physical therapist" or physiotherapy or physiotherapies or physiotherapist):ti,ab
9	[mh "Patient Care Team"] or (multidisciplinary or interdisciplinary or "team based"):ti,ab
10	#1 and (#2 or #3 or #4 or #5 or #6 or #7 or #8 or #9) with Publication Year from 1994 to 2019, in Trials
11	#10 not "conference abstract":pt
12	"conference abstract":pt OR abstracts:ti OR editorial:ti OR reply:ti OR commentary:ti OR cadaver*:ti,ab 'in vitro':ti,ab OR animal*:ti OR dog:ti OR dogs:ti OR canine:ti OR horse:ti OR horses:ti OR equine:ti OR mouse:ti OR mice:ti OR rat:ti OR rats:ti OR rabbit:ti OR rabbits:ti OR sheep:ti OR porcine:ti OR pig:ti OR pigs:ti OR rodent*:ti
13	(#1 and #2) not #12
14	(#1 and #3) not #12
15	(#1 and #4) not #12
16	(#1 and #5) not #12
17	(#1 and #6) not #12
18	(#1 and #7) not #12
19	(#1 and #8) not #12
20	(#1 and #9) not #12
21	#10 not #12

## **Inclusion Criteria**

### **Standard Inclusion Criteria**

- Articles must be a full article report of a clinical study (studies using registry data can be included in a guideline if they are published in a peer-reviewed journal and meets all other inclusion criteria/quality standards).
- Noncomparative case series/incidence/prevalence studies, meeting abstracts, historical articles, editorials, letters, and commentaries are excluded.
- Confounded studies (i.e., studies that give patients the treatment of interest AND another treatment without appropriate sub-analysis or statistical adjustment) are excluded.
- Case series studies that have nonconsecutive enrollment of patients are excluded.
- Controlled trials in which patients were not stochastically assigned to groups AND in which there was either a difference in patient characteristics or outcomes at baseline AND where the authors did not statistically adjust for these differences when analyzing the results are excluded.
- All studies of “Very Low” quality of evidence (e.g., Level V) are excluded.
- Studies not appearing in a peer-reviewed publication are excluded.
- For any included study that uses “paper-and-pencil” outcome measures (e.g., Composite measures, SF36, etc.), only outcome measures that have been validated are included.
- For any given follow-up time point in any included study, there must be  $\geq 50\%$  patient follow-up (if the follow-up is  $>50\%$  but  $<80\%$ , the study quality will be downgraded).
- Studies must be of humans.
- Studies must be published in English.
- Studies results must be quantitatively presented.
- In vitro studies are excluded.
- Biomechanical studies are excluded.
- Studies performed on cadavers are excluded.

We will only evaluate surrogate outcomes when no patient-oriented outcomes are available.

### **Customized Inclusion Criteria**

- Study must be of “individuals with Parkinson disease.”
  - Do NOT include atypical PD, Parkinson plus syndromes, Parkinsonism.
- Study must be published in or after 1994.
- Studies should have “10” or more patients per group.
- Patient outcome follow-up times should be “no restriction.”
- Study must be a randomized controlled trial.

### **Best Available Evidence**

When examining primary studies, we will analyze the best available evidence regardless of study design. We will first consider randomized controlled trials identified by the search strategy. In the absence of 2 or more RCTs, we will sequentially search for prospective controlled trials, prospective comparative studies, retrospective comparative studies, and prospective case-series

studies. Only studies of the highest level of available evidence are included, assuming that there were 2 or more studies of that higher level. For example, if there are 2 high-quality studies that address the recommendation, moderate and low studies addressing the same procedure and outcomes are not included.